UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

AUG 14 1997

MEMORANDUM

SUBJECT: Martha C. Rose Site
Risk-Related Need for Continued Ground Water Monitoring

FROM: Dave Crawford DC
Risk Assessor, SACR/SUPR

TO: Steve Kinser
Remedial Project Manager, MOKS/SUPR

Dave Monroe, our toxicologist, has not been available to review this matter as you requested. Therefore, I have reviewed the relevant documents. At issue is whether or not the ground water monitoring required under the Consent Decree needs to be continued by the responsible parties because of potential risk to human health. The State of Missouri, through both its Health Department (MDOH) and Department of Natural Resources (MDNR) has vigorously opposed any discontinuation of this monitoring.

In order to assess those human health exposure pathways which may currently or in the future be complete, I reviewed the Endangerment Assessment, Part V of the February 1990 Remedial Investigation.

It should be noted that this is now a somewhat dated document, approved in 1990. As such, there may be some discrepancies when this document is compared to our current understanding and application of the relevant risk assessment guidance. (For example, risk is calculated based upon "indicator chemicals", not all chemicals which represented releases from the site.) Nonetheless, the document probably formed a sufficient basis to conclude in 1990 that the risk for reasonable maximum exposures to the contamination at the site exceeded the thresholds identified in the National Contingency Plan (NCP), and that remedial actions were warranted for this site at that time.

In order for there to be risk to human health from a hazardous substance release there must be potential exposure. Therefore, even though there may still be some ground water contamination at the site, other factors may preclude the potential for human exposure, such as:

-Currently, there are no drinking water wells at or near the site. Does the aquifer, or hydrologic unit, beneath the site yield enough water to support the theoretical use of a water well as a private, nonpublic, source of drinking water in the future? 150 galls per day per person is a reasonable estimate on the quantity of water used in the United States. This includes not only drinking, but all other household uses of water.

Few people would build a home or complete a drinking water well to serve only one person. Two people is a reasonable minimum on how many people might be served by even the smallest private water well, which is a minimum of 300 gallons per day per well.

I looked for a reference for information about the minimum yield of private drinking water wells and found a reference on page 458 of "Groundwater and Wells, Second Edition", Fletcher G. Driscoll, which indicates that 30 gallons per minute (gpm) is a reasonable minimum for yield. Boreholes or wells with less yield would seldom be completed as a private water supply well, unless the home were provided with a water holding tank. Few homes have water holding tanks allowing them to use a well with a yield of less than 30 gpm as a source of drinking water.

-Is the groundwater of acceptable quality, if not contaminated by the site, to be used for drinking? Some groundwater is too salty, contains too many solids or too much turbidity, or contains bacteriological contamination, which would preclude its use as a source for drinking water.

-You reported that the city of Holden is establishing an ordinance that would prevent the use of groundwater at the former Martha C. Rose facility, for drinking. If enforced, such an ordinance would also prevent any human exposure to contaminated groundwater.

In summary, if groundwater cannot be used for drinking or other household uses, for any of the above reasons, or because of other reasons which I may not have thought of, then there would be no human exposure (including no ingestion, no inhalation and no dermal absorption) of contaminants in the groundwater. The issues of yield and water quality as they impact whether groundwater can be used as a water supply source relate more to hydrology than to toxicology. There are several options available to you if you need documentation as to whether the groundwater beneath this site is a potentially usable source of water, including EPA contractors and our interagency agreement (IAG) with the U.S. Geological Survey. Cecilia is the Project Officer on that IAG if you need to access it.

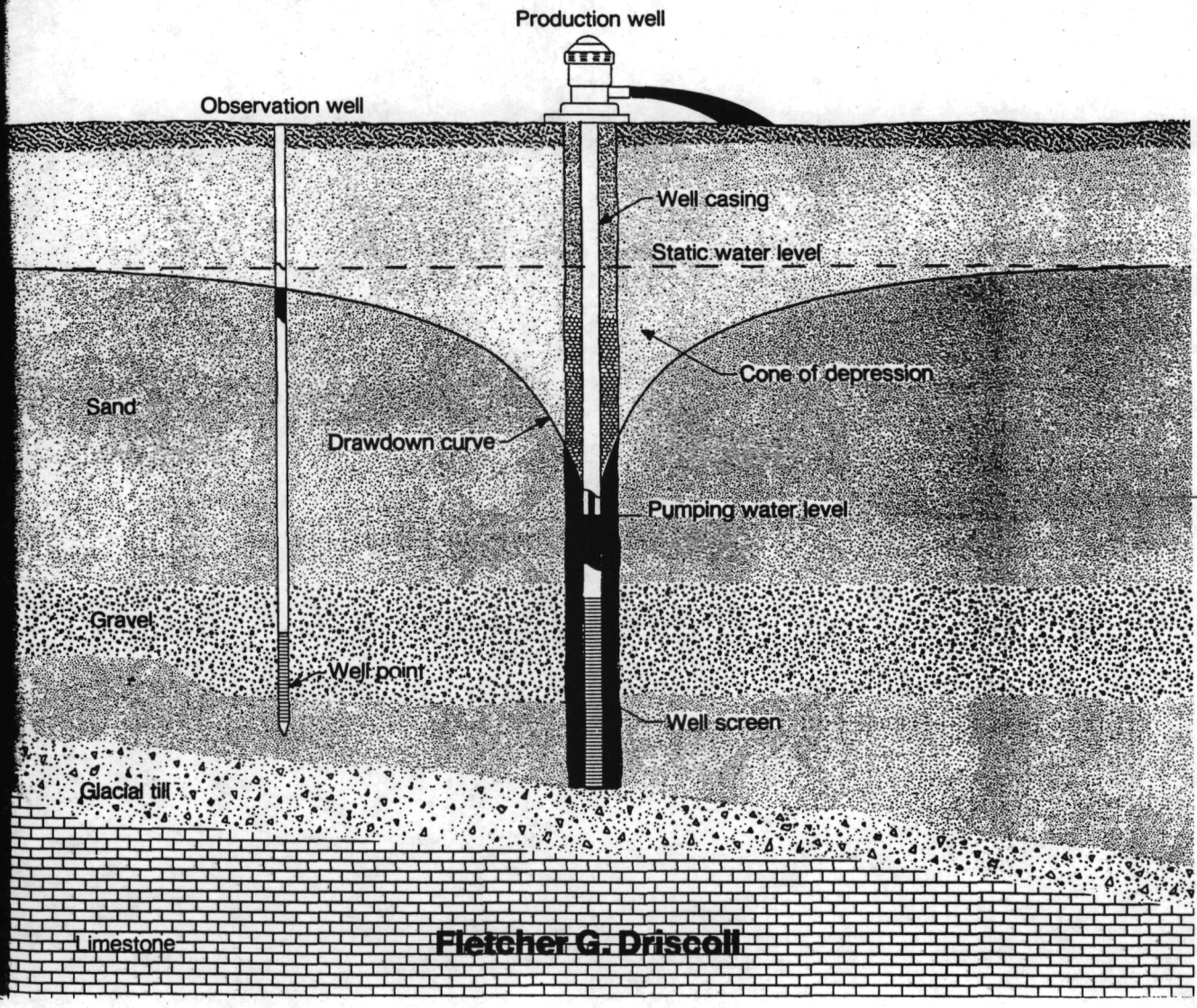
Please contact me at 7702 if you have any questions. This discussion has been limited to potential human health exposures and risks. I do not coordinate ecological risk assessments. You might contact Steve Wharton in the FFSE Branch who coordinates ecological assessments if you need to determine whether the release of contaminated ground water from this site may pose ecological risk.

cc: Dave Monroe SACR Cecilia Tapia SACR

Groundwater and Wells

Second Edition

A comprehensive study of groundwater and the technologies used to locate, extract, treat, and protect this resource.



Fletcher G. Driscoll

open area increases, the collapse strength decreases. Note, however, that the actual effect of open area on screen collapse strength is more a function of screen type. For example, a continuous-slot screen with 40-percent open area may have the same collapse strength under similar conditions as a bridge-slot screen with only 12-percent open area. Specific wire shapes and sizes can be selected to accommodate the anticipated (worst case) collapse pressures.

The tensile strength of a screen is important if the screen is interspaced with blank pipe throughout a formation or if the screen is quite long. Long screens built from welded sections must hold together until the entire string of screen and casing is assembled. Large-diameter continuous-slot screens as long as 1,450 ft (442 m) have been installed recently to depths of 3,000 ft (915 m) in Utah (Schafer, 1981). Tensile and column strength can be enhanced by increasing the size and number of vertical rods.

Long-term screen strength is obtained by selecting a screen material on the basis of water-quality conditions. It is poor practice to overdesign screens (providing excess strength), because this reduces the open area of the screen and increases the cost. General information from manufacturers usually focuses on screens built to standard construction specifications only. Therefore, for any large-diameter screen set at depths greater than 300 ft (91.5 m), the screen manufacturer should be contacted for specific design recommendations.

DESIGN OF DOMESTIC WELLS

Many of the design requirements discussed for high-capacity industrial, municipal, and irrigation wells also apply to domestic, farm, and stock wells. The selection of well screen openings, entrance velocity requirements, and recommended screen and pipe material are as important for these wells as for high-capacity wells.

Thousands of wells are drilled every year for homes and farms where the total water requirements may be 5 to 30 gpm (27 to 164 m^3/day). For these requirements, long screens in relatively thick aquifers would be uneconomical. The farmer and the homeowner, however, need a dependable water supply that can be obtained with reasonable drawdown. In these cases, a compromise is necessary between well cost and well efficiency.

The drilling contractor must insure that enough potential drawdown is available to meet present and future yield requirements. The construction represented by well B in Figure 13.17 can yield three or four times as much water as the unscreened well (well A) and has the additional advantage of not pumping sand. The yield from well B can drop off considerably, however, if drought conditions or other wells in the area should cause lowering of the static water level. Well C

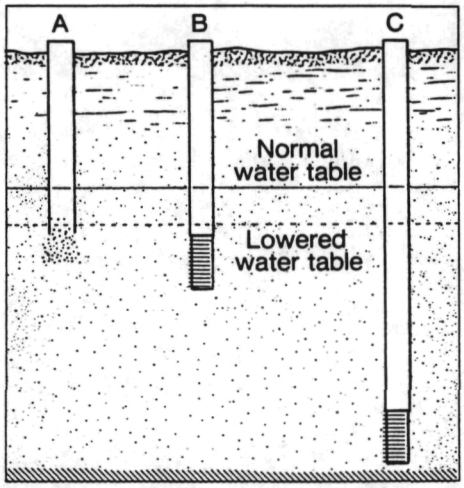
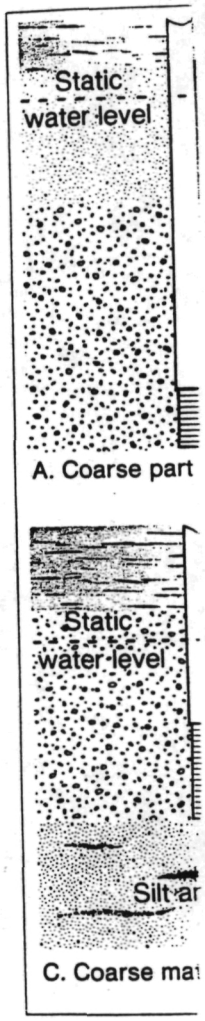


Figure 13.17. Adequate long-term yields are obtained by installing a well screen of adequate length at the proper depth. Enough potential drawdown must be available to meet future yield demands.



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